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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,676	09/30/2003	Marc A. Najork	MSFT-2557/304882.01	4999
41505	7590	09/28/2006	EXAMINER	
WOODCOCK WASHBURN LLP (MICROSOFT CORPORATION) ONE LIBERTY PLACE - 46TH FLOOR PHILADELPHIA, PA 19103			STACE, BRENT S	
		ART UNIT	PAPER NUMBER	
		2161		

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/674,676	NAJORK ET AL.
	Examiner Brent S. Stace	Art Unit 2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 June 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,2,4-12,14-30,32-38 and 40-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,2,4-12,14-30,32-38 and 40-56 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 June 2006 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>6/30/06</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Remarks

1. This communication is responsive to the amendment filed June 30th, 2006. Claims 1, 2, 4-12, 14-30, 32-38, and 40-56 are pending. In the amendment filed June 30th, 2006, Claims 1, 12, 22, 29, 30, 38, 46, 51, 53, and 55 are amended, Claims 3, 13, 31, and 39 are canceled, and Claims 1, 12, 22, 29, 38, 46, 51, 53, and 55 are independent. The examiner acknowledges that no new matter was introduced. This action is FINAL.

Response to Arguments

2. The Applicant's arguments filed June 30th, 2006 with respect to Claims 1, 2, 4-12, 14-30, 32-38, and 40-56 have been considered but are not persuasive.
3. With respect to the Applicant's arguments regarding the 35 USC § 112 first paragraph rejections on Claims 8, 18, 36, and 44, the examiner has considered the applicant's arguments but respectfully disagrees. At least in the applicant's cited sections of the specification, there is not enough evidence to support Claims 8, 18, 36, and 44's "after the data transaction commits." In fact, the specification at paragraph [0064] (published paragraph [0084]), says that in order to have an effective and reliable system for logging (and recovery) the log entry for an operation to be committed must be written to the log prior to the operation being committed. At least this paragraph shows support for the hypothetical claim limitation of "before the data transaction

commits." Therefore, besides there not being support in the specification for "after the data transaction commits," it appears the Applicant is claiming a logging and recovery system that is not effective or reliable (based on the Applicant's own specification).

Additionally, the Applicant's arguments appear to be regarding the event of having the log entry(ies) cached in an intermediate memory rather than the claimed limitation of moving the log entry(ies) from intermediate cache memory to the "log."

4. With their respective amendments the scopes of Claims 1, 12, 29, 38, 51, and 53 have substantially changed, however, the prior art applied from the previous Office action with modified rejections teaches the new claimed limitations.

5. As to the applicant's arguments with respect to Claims 1, 12, 29, 38, 51, and 53 for the prior art(s) allegedly not teaching the claimed subject matter that at least one log entry includes at least one entry from an allocation layer and at least one entry from an B-link tree layer, the examiner respectfully disagrees. At least the newly cited section of Lomet (Lomet, col. 5, lines 38-44) teaches that a log entry includes at least one entry from an allocation layer and at least one entry from an B-link tree layer in that Lomet's RLOG_DATA includes disk block allocates and frees (allocation layer entry) and update/insert/delete actions (B-link tree layer entry for Lehman's B-link tree). As mapped, the behavior of the RLOG_DATA including disk block allocates and frees that has the same behavior as the allocation layer recited in the applicant's specification, published paragraph [0102]. The ULOG data field happens to indirectly also have the same information as the RLOG (at least via the RLSN).

6. As to the applicant's arguments with respect to Claims 22, 46, and 55 for the prior art(s) allegedly not teaching "an upper layer and an allocation layer" the examiner respectfully disagrees. As mentioned above, the allocation layer is these claims also correspond to Lomet's RLOG_DATA including disk block allocates and frees. The remainder of the information in the log not concerning the allocation layer entry(ies) is mapped to the "upper layer."
7. The other claims argued merely because of a dependency on a previously argued claim(s) in the arguments presented to the examiner, filed June 30th, 2006, are moot in view of the examiner's interpretation of the claims and art and are still considered rejected based on their respective rejections from the first Office action (parts of recited again below).

Information Disclosure Statement

8. The information disclosure statement is being considered by the examiner.

Specification

9. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

15. Claims 10, 11, 20, 21, 27, and 28 are still rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

16. Claims 10, 20, and 27 are rejected under 35 U.S.C. 101 because it is not limited to tangible embodiments. In view of Applicant's disclosure, specification at paragraph [0036] (published paragraph [0045]), the medium is not limited to tangible embodiments, instead being defined as including both tangible embodiments (e.g., CDROM) and intangible embodiments (e.g., "modulated data signal"). As such, the claim is not limited to statutory subject matter and is therefore non-statutory. The claim may be favorably considered if the executable instructions were explicitly stored on the computer readable medium.

17. Claims 11, 21, and 28 are specifically modulated data signals and are non-statutory since they are not tangible.

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

10. In light of the applicant's respective arguments or respective amendments, the previous drawing objections to the drawings have been withdrawn.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

12. Claims 8, 18, 36, and 44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 8, 18, 36, and 44 recite "after the data transaction commits." The examiner only sees support in the specification for the hypothetical limitation "before the data transaction commits" (see paragraphs [0064] and [0067] of respective pages 20 and 21 of the present application).

Claim Rejections - 35 USC § 101

13. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

14. In light of the applicant's respective arguments or respective amendments, the previous 35 U.S.C. 101 rejections to Claims 1-9, 12-19, 22, 24-26, 29-46 and 48-55 have been withdrawn.

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

20. Claims 1-21, 29-45, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of "Efficient Locking for Concurrent Operations on B-Trees" (Lehman et al.).

For **Claim 1**, Lomet teaches: "A method for logging while updating via a plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said B-link tree, [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] wherein said at least one log entry includes at least one entry from an allocation layer [Lomet, col. 1, lines 65-67 with Lomet, col. 5, lines 38-44] and at least one entry from a B-link tree layer; [Lomet, col. 19, lines 35-37 with Lomet, col. 5, lines 38-44] and
- storing said at least one log entry into a log" [Lomet, col. 19, lines 35-37].

Lomet discloses the above limitations but does not expressly teach:

- "a B-link tree."

With respect to Claim 1, an analogous art, Lehman, teaches:

- "a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet's invention because both inventions use databases. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet, thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet.

Claim 2 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including periodically truncating the log" [Lomet, cols. 11-12, lines 60-12].

Claim 4 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including discarding said at least one log entry from the log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-12].

Claim 5 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, wherein said storing includes storing said at least one log entry

into the log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].

Claim 6 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].

Claim 7 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including storing said at least one log entry in an intermediate memory previous to storing said at least one log entry in the log" [Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

Claim 8 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 7, wherein said at least one log entry is moved from intermediate memory to the log after the data transaction commits" [Lomet, col. 16, lines 23-25].

Claim 9 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry" [Lomet, col. 5, lines 44-52].

Claim 10 encompasses substantially the same scope of the invention as that of Claim 1, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 1. Therefore, Claim 10 is rejected for the same reasons as stated above with respect to Claim 1.

Claim 11 encompasses substantially the same scope of the invention as that of Claim 1, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 1. Therefore, Claim 11 is rejected for the same reasons as stated above with respect to Claim 1.

For **Claim 12**, Lomet teaches: "A method for logging while updating via a plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said B-link tree, [Lomet, col. 19, lines 35-37 with Lomet, col. 19, lines 45-51] wherein said at least one log entry includes at least one entry from an allocation layer [Lomet, col. 1, lines 65-67 with Lomet, col. 5, lines 38-44] and at least one entry from a B-link tree layer; [Lomet, col. 19, lines 35-37 with Lomet, col. 5, lines 38-44]
- storing said at least one log entry into a finite log; [Lomet, col. 19, lines 45-51]
- periodically flushing data corresponding to data transactions represented by the finite log to persistent storage; [Lomet, col. 14, lines 9-17] and
- truncating said finite log in coordination with said flushing" [Lomet, col. 14, lines 9-17].

Lomet discloses the above limitations but does not expressly teach:

- "a B-link tree."

With respect to Claim 12, an analogous art, Lehman, teaches:

- "a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet's invention because both inventions use databases. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet. Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet, thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet.

Claim 14 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including discarding said at least one log entry from the finite log when the data transaction has been carried out on said B-link tree" [Lomet, col. 14, lines 9-17].

Claim 15 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, wherein said storing includes storing said at least one log entry into the finite log before the data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34].

Claim 16 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 1, further including caching data of said data transaction before said data transaction is carried out on said B-link tree" [Lomet, col. 7, lines 26-34 with Lomet, col. 5, lines 1-11].

Claim 17 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including storing said at least one log entry in an intermediate memory previous to storing said at least one log entry in the finite log" [Lomet, col. 7, lines 26-34 with Lomet, col. 19, lines 35-37].

Claim 18 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 17, wherein said at least one log entry is moved from intermediate memory to the finite log after the data transaction commits" [Lomet, col. 16, lines 23-25].

Claim 19 can be mapped to Lomet (as modified by Lehman) as follows: "A method according to claim 12, further including maintaining a log sequence number with each of said at least one log entry, uniquely identifying said at least one log entry" [Lomet, col. 5, lines 44-52].

Claim 20 encompasses substantially the same scope of the invention as that of Claim 12, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 12. Therefore, Claim 20 is rejected for the same reasons as stated above with respect to Claim 12.

Claim 21 encompasses substantially the same scope of the invention as that of Claim 12, in addition to a modulated data signal and some executable instructions for

performing the method steps of Claim 12. Therefore, Claim 21 is rejected for the same reasons as stated above with respect to Claim 12.

Claims 29 and 30 encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a server and some actions for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 29 and 30 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

Claims 32-37 encompass substantially the same scope of the invention as that of Claims 4-9, respectfully, in addition to a server and some actions for performing the method steps of Claims 4-9, respectfully. Therefore, Claims 32-37 are rejected for the same reasons as stated above with respect to Claims 4-9, respectfully.

Claim 38 encompasses substantially the same scope of the invention as that of Claim 12, in addition to a server and some objects for performing the method steps of Claim 12. Therefore, Claim 38 is rejected for the same reasons as stated above with respect to Claim 12.

Claims 40-45 encompass substantially the same scope of the invention as that of Claims 14-19, respectfully, in addition to a server and some objects for performing the method steps of Claims 14-19, respectfully. Therefore, Claims 40-45 are rejected for the same reasons as stated above with respect to Claims 14-19, respectfully.

Claims 51 and 52 encompass substantially the same scope of the invention as that of Claims 1 and 2, respectfully, in addition to a computing device and some means for performing the method steps of Claims 1 and 2, respectfully. Therefore, Claims 51

and 52 are rejected for the same reasons as stated above with respect to Claims 1 and 2, respectfully.

Claims 53 and 54 encompass substantially the same scope of the invention as that of Claims 12 and 14, respectfully, in addition to a computing device and some means for performing the method steps of Claims 12 and 14, respectfully. Therefore, Claims 53 and 54 are rejected for the same reasons as stated above with respect to Claims 12 and 14, respectfully.

21. Claims 22, 23, 26-28, 46, 47, 50, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No. 5,434,994 (Shaheen et al.).

For **Claim 22**, Lomet teaches: "A method for logging while updating a data structure via a plurality of data transactions, [Lomet, col. 7, lines 26-34] comprising:

- generating at least one log entry corresponding to a data transaction of the plurality of data transactions, the data transaction to be carried out on said data structure; [Lomet, col. 22, lines 25-30 with Lomet, col. 19, lines 35-37] and
- where the log is partitioned into an upper layer and an allocation layer, [Lomet, col. 5, lines 31-45 with Lomet, Fig. 3] wherein the single log includes log entries from both the upper layer and allocation layer" [Lomet, col. 5, lines 15-22 with Lomet, Fig. 3].

Lomet discloses the above limitations but does not expressly teach:

- “replicating updates to the data structure to a first server location and a second server location;
- maintaining a single log at each of said first and second server locations.”

With respect to Claim 22, an analogous art, Shaheen, teaches:

- “replicating updates to the data structure to a first server location and a second server location; [Shaheen, col. 7, lines 50-55]
- maintaining a single log at each of said first and second server locations” [Shaheen, col. 4, lines 62-66].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Shaheen with Lomet because both inventions are directed towards recovering data upon failure.

Shaheen's invention would have been expected to successfully work well with Lomet's invention because both inventions use computers using logs. Lomet discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet does not expressly disclose replicating data on multiple servers, or maintaining a single log on those servers. Shaheen discloses a system and method for maintaining replicated data coherency in a data processing system comprising replicating data and logs across multiple servers.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the replication of data and logs across multiple servers from Shaheen and install it into the invention of Lomet, thereby offering the obvious advantage of

making Lomet distributed to increase the availability and reliability of distributed systems of Lomet.

Claim 23 can be mapped to Lomet (as modified by Shaheen) as follows: “A method according to claim 22, further including recovering the data structure after a failure by performing parallel recovery operations by each of said first and second server locations” [Shaheen, col. 4, lines 60-66 with Shaheen, col. 7, lines 49-57].

Claim 26 can be mapped to Lomet (as modified by Shaheen) as follows: “A method according to claim 22, wherein the allocator layer handles at least one of (A) an allocate disk space operation, (B) a deallocate disk space operation, (C) a read from the allocated disk space operation and (D) a write to the allocated disk space operation” [Lomet, col. 5, lines 31-38].

Claim 27 encompasses substantially the same scope of the invention as that of Claim 22, in addition to computer readable medium and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 27 is rejected for the same reasons as stated above with respect to Claim 22.

Claim 28 encompasses substantially the same scope of the invention as that of Claim 22, in addition to a modulated data signal and some executable instructions for performing the method steps of Claim 22. Therefore, Claim 28 is rejected for the same reasons as stated above with respect to Claim 22.

Claims 46, 47, and 50 encompass substantially the same scope of the invention as that of Claims 22, 23, and 26, respectfully, in addition to a serer and some objects for performing the method steps of Claims 22, 23, and 26, respectfully. Therefore, Claims

46, 47, and 50 are rejected for the same reasons as stated above with respect to Claims 22, 23, and 26, respectfully.

Claims 55 and 56 encompass substantially the same scope of the invention as that of Claims 22 and 23, respectfully, in addition to a computing device and some means for performing the method steps of Claims 22 and 23, respectfully. Therefore, Claims 55 and 56 are rejected for the same reasons as stated above with respect to Claims 22 and 23, respectfully.

22. Claims 24, 25, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,485,608 (Lomet et al.) in view of U.S. Patent No. 5,434,994 (Shaheen et al.), further in view of Efficient Locking for Concurrent Operations on B-Trees (Lehman et al.).

For **Claim 24**, Lomet (as modified by Shaheen) teaches: "A method according to claim 22."

Lomet (as modified by Shaheen) discloses the above limitation but does not expressly teach: "wherein said data structure is a B-link tree."

With respect to Claim 24, an analogous art, Lehman, teaches: "wherein said data structure is a B-link tree" [Lehman, p. 657, section 3.3].

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Lehman with Lomet (as modified by Shaheen) because both inventions are directed towards storing information in a database.

Lehman's invention would have been expected to successfully work well with Lomet (as modified by Shaheen)'s invention because both inventions use databases. Lomet (as modified by Shaheen) discloses methods and an apparatus for updating information in a computer system using logs and state identifiers comprising Rlogs, Ulogs and Alogs, however Lomet (as modified by Shaheen) does not expressly disclose the use of a B-link-tree to store the data in the database of Lomet (as modified by Shaheen). Lehman discloses efficient locking for concurrent operations on B-trees comprising a B-link-tree.

It would have been obvious to one of ordinary skill in the art at the time of invention to take the b-link-tree from Lehman and install it into the invention of Lomet (as modified by Shaheen), thereby offering the obvious advantage of a guaranteed small (average) search, insertion, and deletion time for the database of Lomet (as modified by Shaheen).

Claim 25 can be mapped to Lomet (as modified by Shaheen) as follows: "A method according to claim 24, wherein the upper layer is a B-link tree layer that handles B-link tree operations" [Lomet, col. 5, lines 39-44].

Claims 48 and 49 encompass substantially the same scope of the invention as that of Claims 24 and 25, respectfully, in addition to a server and some objects for performing the method steps of Claims 24 and 25, respectfully. Therefore, Claims 48 and 49 are rejected for the same reasons as stated above with respect to Claims 24 and 25, respectfully.

23. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent S. Stace whose telephone number is 571-272-8372 and fax number is 571-273-8372. The examiner can normally be reached on M-F 9am-5:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brent Stace

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JEFFREY GAFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100